TRENDS

IN

LOW BIRTHWEIGHT

TENNESSEE
1980-1997

Prepared by: State of Tennessee, Department of Health
Bureau of Policy Planning and Assessment
Office of Health Statistics and Research

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Trends *in* Low Birthweight

Tennessee 1980-1997

CONTENTS

HOW ARE WE DOING?

This report provides information about trends in low birthweight for Tennessee from 1980 to 1997. The percentage of low birthweight has increased over the past 17 years, despite declines in many of the risk factors. This increase is of great concern because low birthweight is associated with many negative outcomes for infants. This report will describe trends in Tennessee, compare Tennessee with the United States, and explore reasons for the increase in low birthweight. Data for regional and county trends are also provided.

Low Birthweight. Low birthweight (<2,500 grams) is a major risk factor for negative infant outcomes including: death during infancy, developmental disabilities, physical disabilities, health problems, hearing and vision problems and learning disabilities. Negative outcomes are even more likely for infants born with very low birthweight (<1500 grams). Known risk factors for low birthweight include lack of prenatal care, smoking during pregnancy, unmarried women, extreme (young or old) maternal age, multiple births, race, and maternal education.

Recent trends. The percentage of low birthweight has increased 10 percent since 1980. The percentage of increase in low birthweight for Tennessee is similar to the increase for the United States. The increase in Tennessee's low birthweight percentage is largely due to an increase in the percentage of very low birthweight.

Maternal Ethnicity. Percentages of low birthweight for black mothers are about two times greater than the percentages for white mothers. However, the trend for black mothers remained fairly steady, whereas the trend for white mothers was steadily increasing.

Maternal Age. Low birthweight percentages were highest for younger mothers (<20 years) and older mothers (>40 years). The greatest increase in low birthweight was found among the oldest mothers (>40 years). However, for very low birthweight, the greatest increase was for mothers in the 30-34 years age group. The increase in overall birthweight likely represents an increase in multiple births for older women, whereas the increase for very low birthweight may be the result of the increased medical ability to save very small babies.

Number of Births. Percentages of both low and very low birthweight were higher for multiple births than for singleton births. For singleton births, there was an increase in both low and very low birthweight. For twins, there was an increase in low birthweight and a decrease in very low birthweight. Finally, for births of three of more infants (triplets plus) there was a decrease in both low and very low birthweight.

Risk factors. Risk factors for low birthweight include: maternal age (teenagers or older mothers), unmarried women, inadequate prenatal care, low maternal education, smoking during pregnancy, and multiple births.

Improvements. Tennessee saw improvements for the following risk factors: a decrease in the percentage of births to teenagers, an increase in the percentage of women receiving adequate prenatal care, an increase in maternal education, and a decrease in smoking during pregnancy

Areas of Concern. Likewise, some daunting conditions were noted in the following risk factors from 1980 to 1997 an increase in the percentage of births to older mothers, an increase in the percentage of mothers who were unmarried, and an increase in the percentage of births that were multiple.

Why is low birthweight increasing? For white mothers, part of the increase in low birthweight can be attributed to increases in multiple births and increases in births to unmarried women. However, a large portion of the increase remains unexplained. For black mothers, the increase in low birthweight can be explained by changes in maternal age, increases in multiple births, and increases in births to unmarried women. Had there been no changes in the risk factors for low birthweight, percentages would have declined for black mothers.

Regional Trends. The percentage of low birthweight was high and increasing for Davidson, Shelby, Hamilton, and Knox regions. The percentages for Madison were average, but had the highest increase of the entire metropolitan region. For the rural regions, the percentages were low and decreasing for the Northwest, Upper Cumberland, East Tennessee, Mid-Cumberland and Southeast regions. The Northeast region had the highest percentage of low birthweight of all rural regions during 1995-1997, as well as the most substantial increase.

RECENT TRENDS

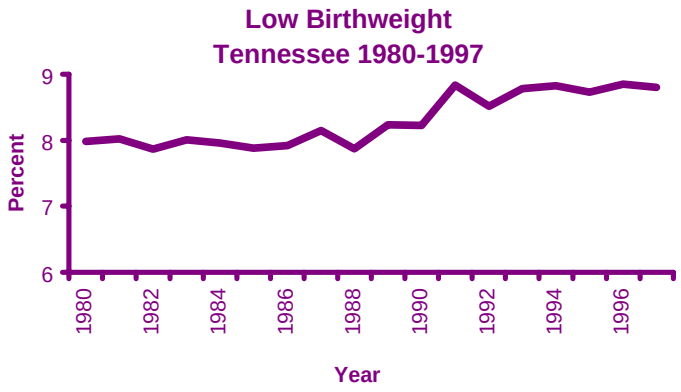
In Tennessee…

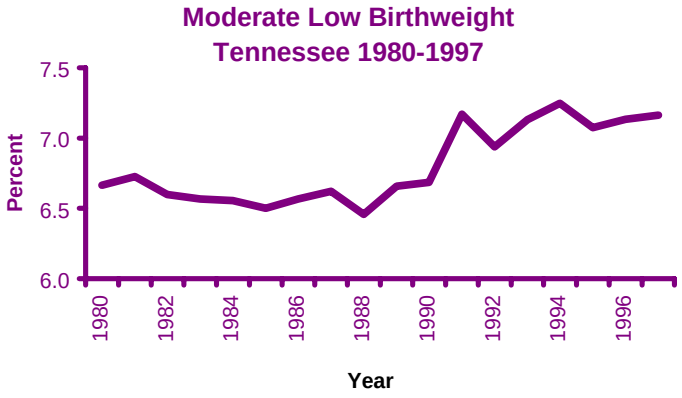
The percentage of low birthweight in Tennessee has increased from 8.0 in 1980 to 8.8 in 1997, a 10.3 percent increase.

There have been several trends in low birthweight between 1980 to 1997. From 1980 to 1988, the percentage of low birthweight was declining slowly. However, between 1988 and 1993, low birthweight increased from 7.9 to 8.8, an increase of 11.6 percent. The percentage since 1993 has remained steady.

Children born low birthweight (LBW) are at risk for problems later in life. Low birthweight is defined as less than 2500 grams (5 lb., 8 oz).

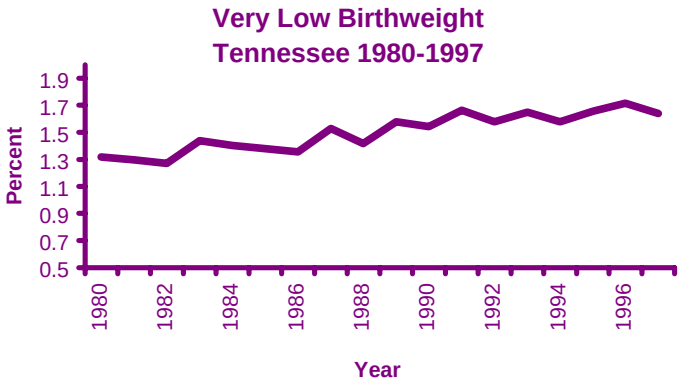
Low birthweight can be further split into moderate low birthweight (1500-2499 grams) and very low birthweight (<1500 grams, 3 lb., 5 oz.).



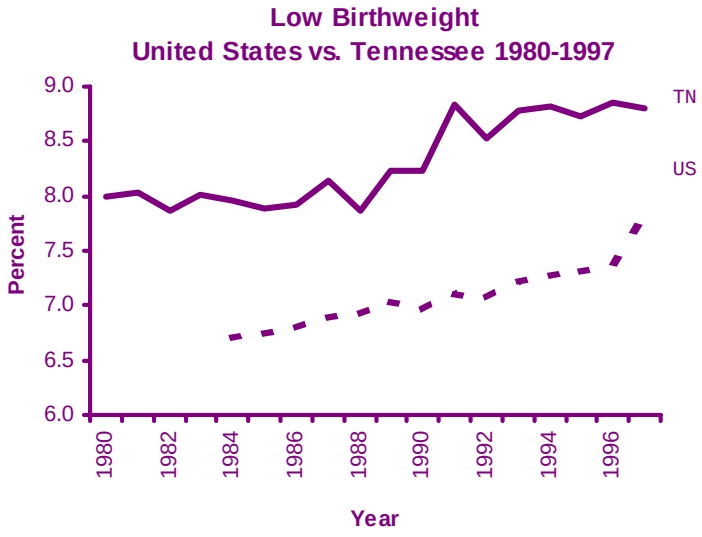


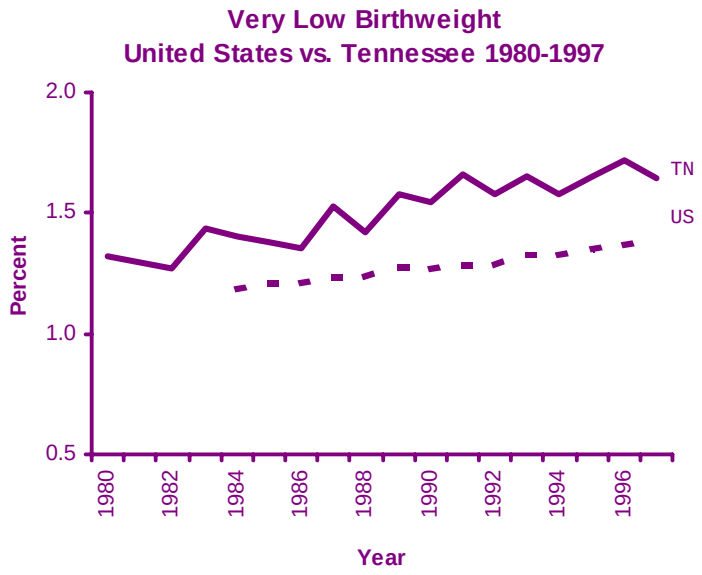
Moderate low birthweight increased 7.5

Very low birthweight increased 24.4



Tennessee vs. United States





Trends in Low Birthweight

Low birthweight has increased nationally from 6.8 in 1980 to 7.8 in 1997, a 14 percent increase.

The increase in Tennessee's low birthweight percentage for the same period was 10.3 percent, from 8.0 to 8.8.

Tennessee's low birthweight percentage is increasing similar to the national percentage.

Trends in Very Low Birthweight

Very low birthweight has increased nationally from 1.2 in 1980 to 1.4 in 1997, a 21.7 percent increase.

The increase in Tennessee's very low birthweight percentage for the same period was 24.4 percent, from 1.3 to 1.6.

Tennessee's low birthweight percentage is increasing faster than the national percentage.

trends by maternal ethnicity…

Over the period of 1980-1997, the percentage of low birthweight increased for all maternal ethnicity gAroups.

*White mothers…*The overall trend increased, with a 16.4 percent increase from 6.4 to 7.4.

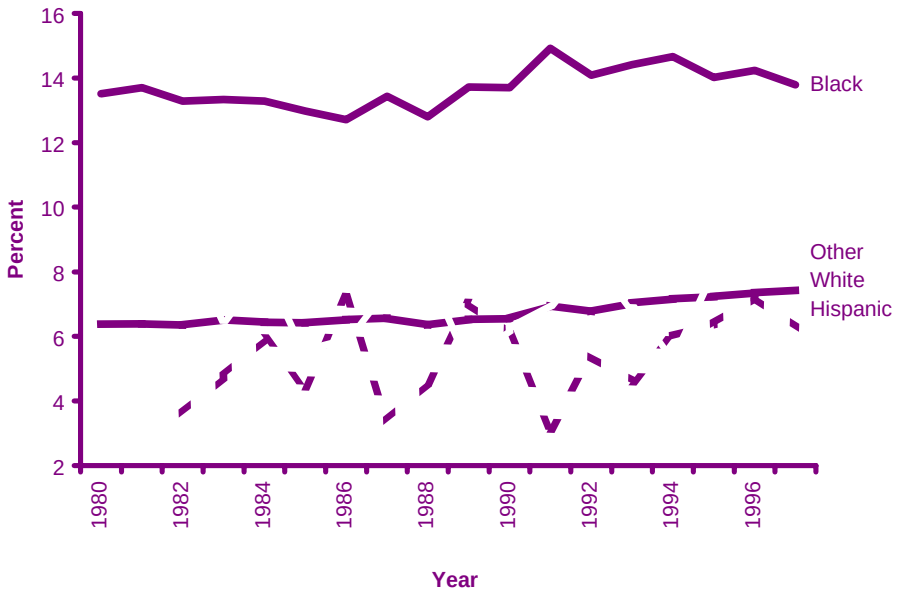
*Black mothers…*The overall trend increased; however, the percent change was a low 2.1 percent from 13.5 to 13.8.

*Hispanic mothers…*The overall trend increased and the greatest percent increase in low birthweight occurred for Hispanic mothers. The percentage of low birthweight increased from 3.6 to 6.3, a 74 percent increase. Note: This increase may be partially due to a change in reporting of ethnicity on the birth certificate.

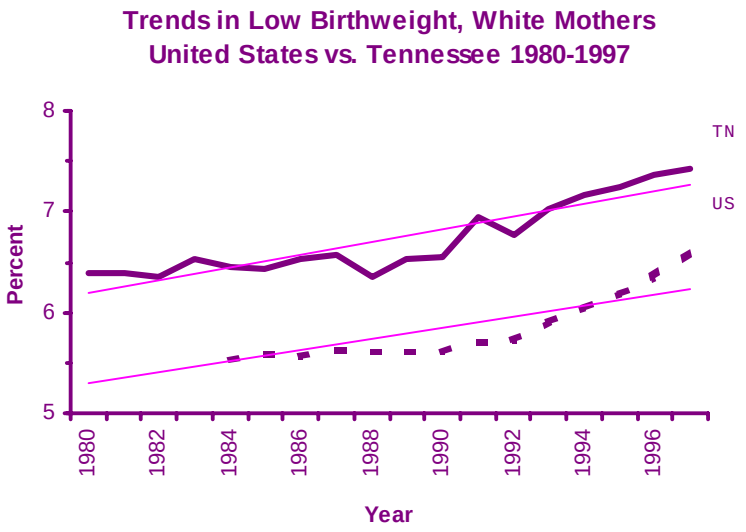
*Other mothers…*The increase in low birthweight for other mothers was 8.3 from 7.3 to 7.9 percent.

Maternal ethnicity was defined according to information recorded on the birth certificate. Mothers who indicated they were of Hispanic descent were classified as Hispanic, regardless of race. Thus races of white or black are non-Hispanic. Mothers who identified an ethnicity other than white, black, or Hispanic were considered to be of other ethnicity.

Low Birthweight by Maternal Ethnicity
Tennessee 1980-1997



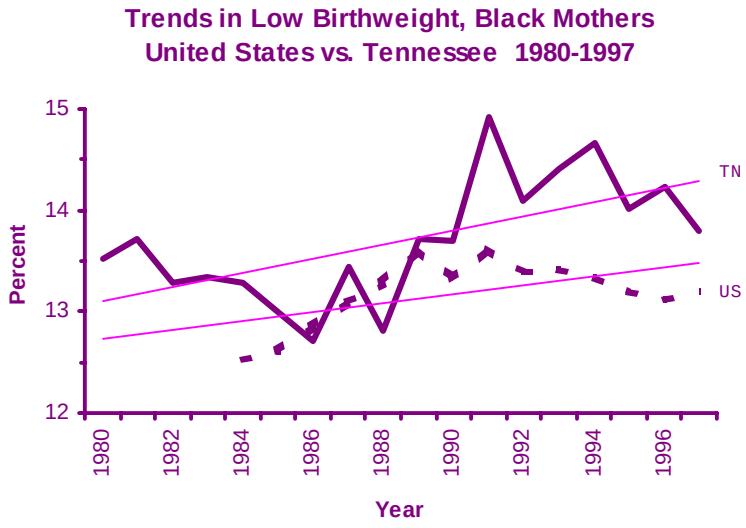
Tennessee vs. United States: White mothers



The percentage of *low birthweight for white moms* increased both in Tennessee and in the United States.

As of 1997, the percentage for white mothers in Tennessee was increasing slightly faster than the national percentage.

Tennessee vs. United States: Black mothers



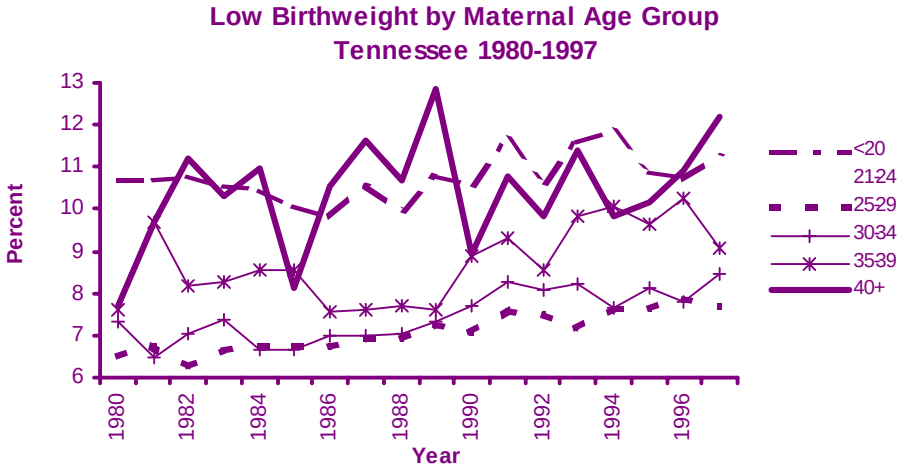
The percentage of *low birthweight for black moms* increased both in Tennessee and in the United States.

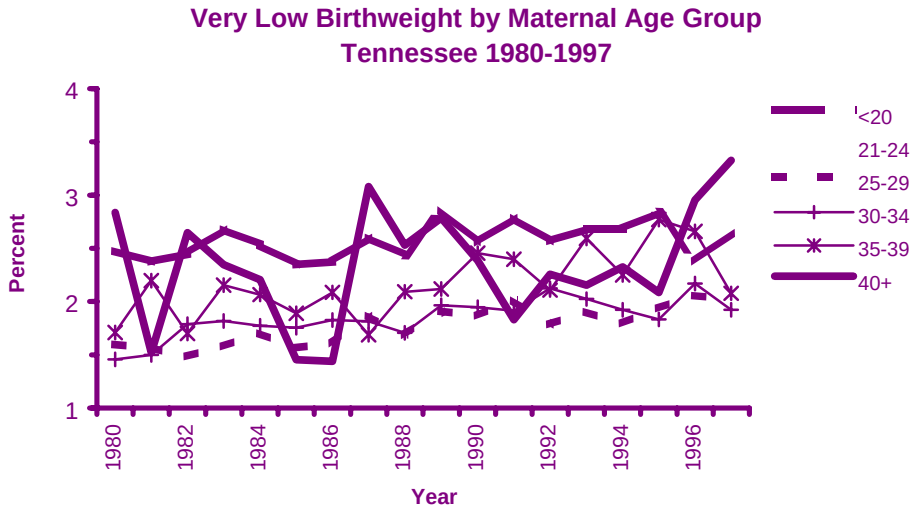
As of 1997, the percentage for black mothers in Tennessee was increasing about twice as fast as the national percentage.

However, from 1991 to 1997, the percentage of decrease in low birthweight for black mothers in Tennessee has been greater than the decrease seen for the United States.

trends by maternal age…

- ✔ Rates of low birthweight increased for all age groups from 1980 to 1997.
- ✔ The greatest percentage increase in low birthweight occurred for mothers 40 years and older. This increase for older mothers may be caused by the increase in multiple births for that population.
- ✔ The increases for very low birthweight followed a different pattern; the greatest percentage increase occurred for mothers in the 30-34 age group.



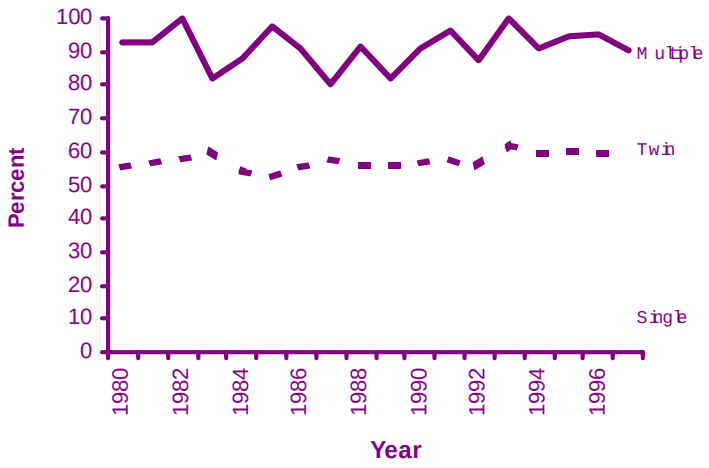


trends by number of births…

Low Birthweight
by
Number of Births

- Singleton births have a markedly lower probability of being low birthweight than births of twins, triplets, or more. On average over the past two decades, 7 percent of singleton births were low birthweight, compared to 58 percent of twins and 91 percent of triplets plus.
- From 1980 to 1997, percentages of low birthweight increased for single births and twin births, but not for multiple births.
- The percentage of low birthweight for singletons was 7.0 in 1980 and 7.4 in 1997, an increase of 5.8 percent.
- Twins' percentage of low birthweight increased from 55.7 to 59.3, a 6.4 percent increase.
- The low birthweight percentage for triplets plus actually decreased from 93.1 to 90.7, a 2.6 percent decrease.

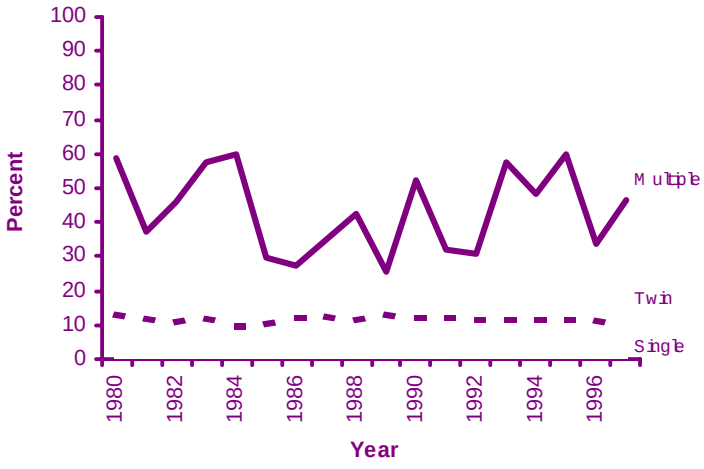
Low Birthweight by Number of Births
Tennessee 1980-1997



Very Low Birthweight
by
Number of Births

- Over the past two decades, an average of 43 percent of births to triplets plus were very low birthweight. In contrast, only 1 percent of singletons and 12 percent of twins were very low birthweight.
- From 1980 to 1997, percentages of very low birthweight increased for singletons and decreased for all other births.
- The percentage of very low birthweight for singletons was 1.1 in 1980 and 1.4 in 1997, an increase of 28.6 percent.
- Twins' percentage of very low birthweight decreased from 13.4 to 10.6, a 20.9 percent decrease.
- The very low birthweight percentage for triplets

Very Low Birthweight by Number of Births
Tennessee 1980-1997



RISK FACTORS

Past research suggests that the following maternal factors are related to low birthweight:

- ✔ Maternal Age
- ✔ Marital Status
- ✔ Prenatal Care
- ✔ Smoking During Pregnancy
- ✔ Number of Births

In order to understand how these risk factors impact the trends in low birthweight, it is important to examine the trends for each of the risk factors.

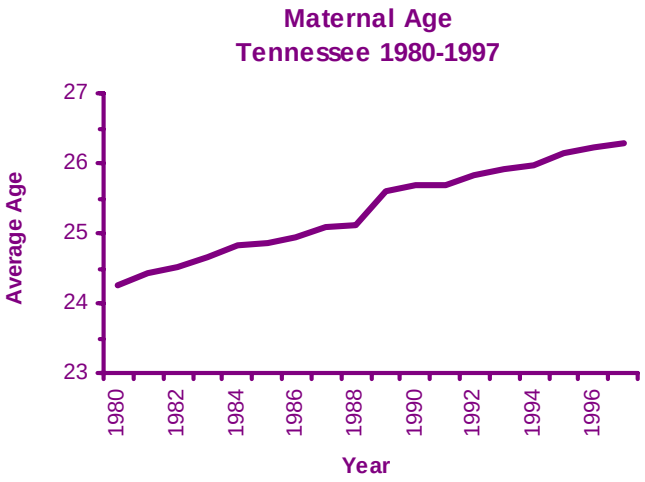
Maternal Age

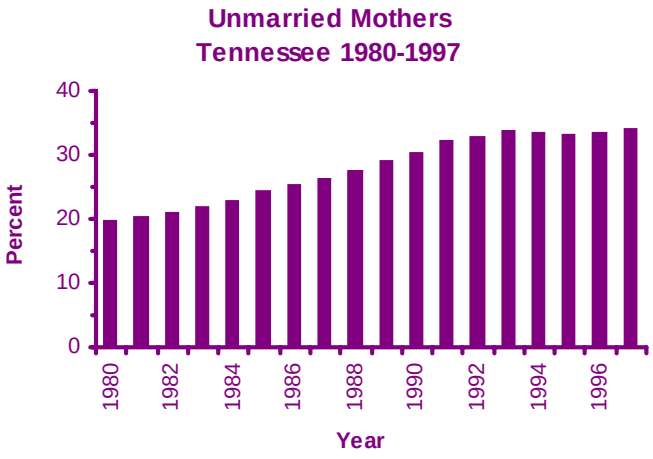
The average age of women giving birth has increased from 24.3 years to 26.3 years, an 8 percent increase.

Mothers at greatest risk for giving birth to a low birthweight infant are teenage mothers and older mothers.

The percentage of births to teenage mothers has decreased 33 percent from 19.9 percent to 13.3 percent. This should result in an overall decrease in the overall percentage of low birthweight.

The percentage of births to older mothers has increased 173 percent from 3.7 percent to 10.2 percent. This should result in an increase in the overall percentage of low birthweight.



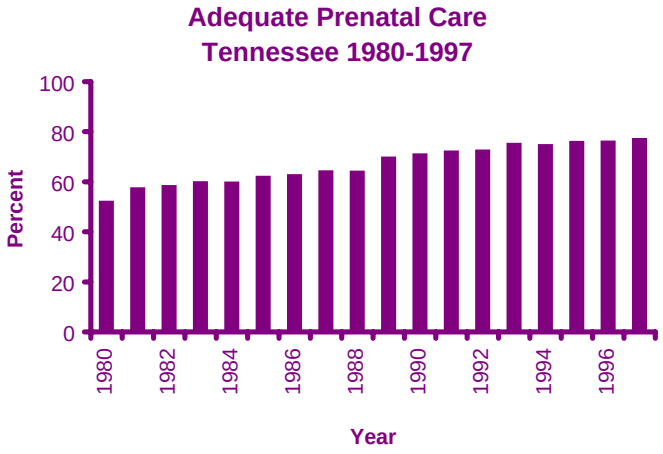


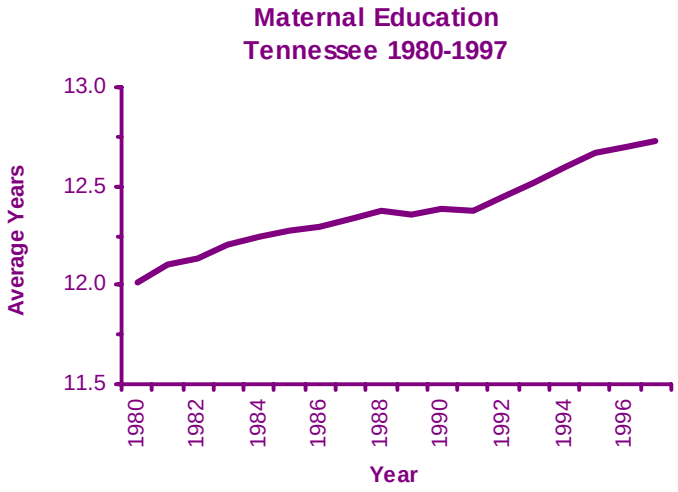
Marital Status

The percent of women giving birth who were unmarried has increased. In 1980, 19.8 percent of women giving birth were unmarried. The percent of births to unmarried moms increased to 34.1 percent, a 72 percent increase.

Prenatal Care

The percentage of mothers receiving at least adequate prenatal care (based on the APNCU index) increased from 51.9 percent in 1980 to 76.9 percent in 1997. This represents a 48 percent increase in the number of mothers receiving adequate prenatal care.



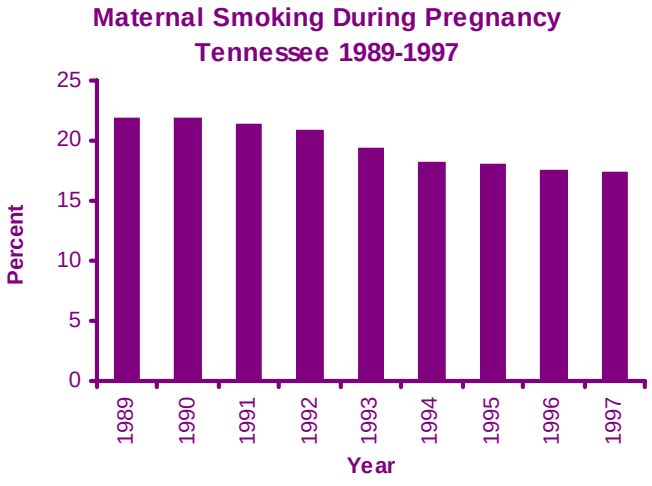


Maternal Education

The average years of education increased from 12 years in 1980 to 12.7 years in 1997. This represents an increase of 5.9 percent in maternal education. This increasing trend may be related to an increase in maternal age, as older mothers have had greater opportunity for increased education.

Smoking During Pregnancy

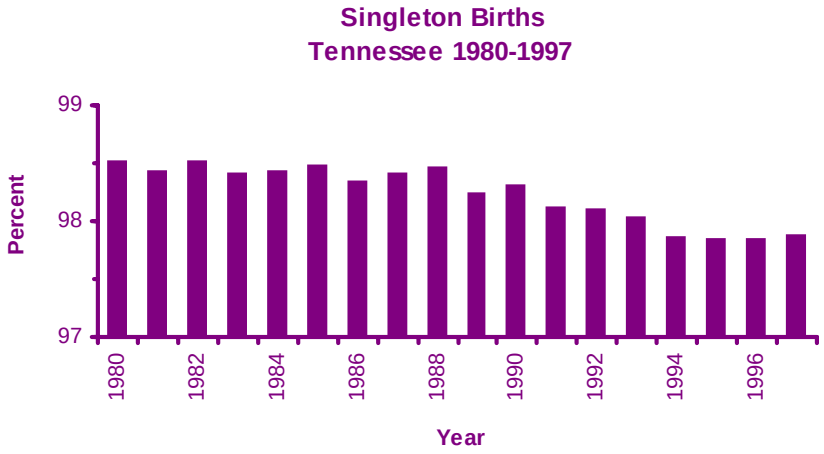
The average percentage of mothers who smoked during pregnancy decreased from 21.9 percent in 1989 to 17.4 percent, a 20.6 percent decrease. Note that data on smoking during pregnancy was not collected prior to 1989.



Number of Births

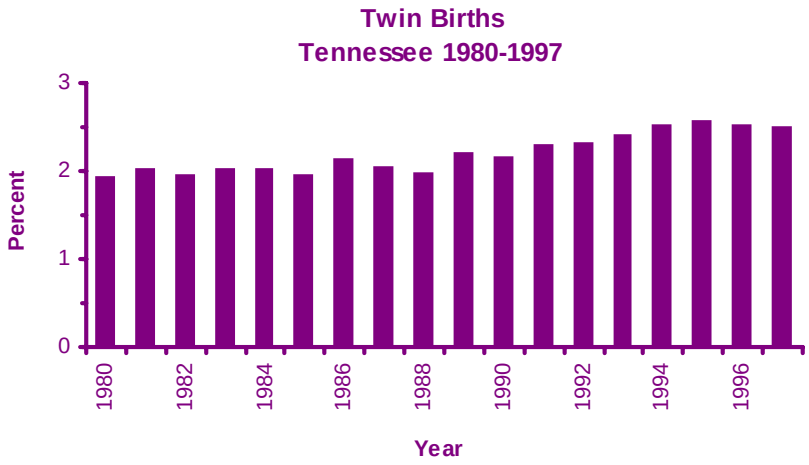
Singleton Births

The percentage of women having singletons has decreased .6 percent from 98.0 percent in 1980 to 97.4 percent in 1997.



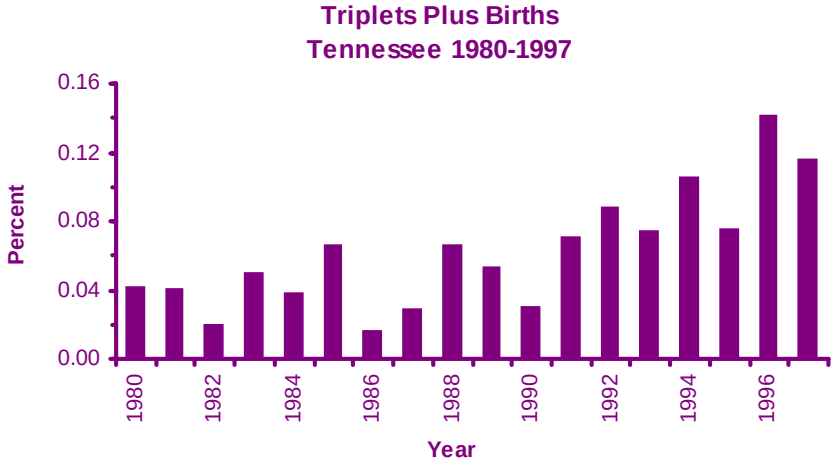
Twin Births

The percentage of women having twins has increased 29.1 percent from 1.9 percent to 2.5 percent.



Triplet Plus Births

The percentage of births of triplets plus increased 175.2 percent from .04 percent to .12 percent. Because multiple births are highly likely to be low birthweight, the increase in multiple births is likely to impact percentages of low birthweight.



WHY IS LOW BIRTHWEIGHT INCREASING?

The percentage of low birthweight has increased since 1980. Trends in several of the risk factors for low birthweight suggest that there have been changes in the risk factors as well. These changes may explain why there has been a change in the percentage of low birthweight.

The impact of increasing maternal age, increased multiple births, and increased unmarried mothers on low birthweight percentages have been examined. Adjusted 1997 percentages of low birthweight were calculated to determine what the percentage would have been if there had been no change in the risk factor. For example, the 1997 percentage adjusted for maternal age would provide the expected low birthweight percent if there had been no increase in maternal age. By comparing the adjusted percentage with the actual percentages from 1980 and 1997, the amount of increase due to changes in the risk factor can be determined.

Due to substantial ethnic differences in low birthweight, reasons for the increase in low birthweight has been examined separately for white and black mothers.

actual increases...

- For white mothers, percentages of low birthweight increased from 6.4 to 7.4, a 16 percent increase.
- For black mothers, percentages of low birthweight increased from 13.5 in 1980 to 13.8 in 1997, a 2 percent increase.

maternal age...

- For white mothers, the 1997 adjusted percentage was 7.6, even higher than the actual percentage.
- For black mothers, the 1997 adjusted percentage was 13.6, somewhat lower than the actual percentage.
- This suggests that for white mothers, none of the increase in low birthweight was due to an increase in maternal age; however, for black mothers, part of the increase in low birthweight was due to changes in the maternal age.

number of births...

- For white mothers, the 1997 adjusted percentage was 7.0, slightly lower than the actual percentage.
- For black mothers, the 1997 adjusted percentage was 13.5, lower than the actual percentage.
- For both white and black mothers, the increase in number of multiple births provides a partial explanation for the increase in low birthweight.

marital status…

- For white mothers, the 1997 adjusted percentage was 7.0, slightly lower than the actual percentage.
- For black mothers, the 1997 adjusted percentage was 13.2, lower than the both the 1980 and 1997 percentages.
- For white and black mothers, the increase in births to unmarried women partially accounts for the increase in low birthweight. For black mothers, the adjusted percentage was lower than the 1980 percentage, suggesting that the 1997 percentage of low birthweight would have decreased if the percent of unmarried women giving birth had remained constant.

the impact of risk factors on increasing low birthweight…

White mothers

The increase in the percentage of low birthweight can be partially explained by increases in multiple births and increases in the percent of unmarried women giving birth. None of the increase in low birthweight can be attributed to an increase in maternal age. This leaves a substantial portion of the increase in low birthweight for white mothers unexplained.

White Mothers	Percent	
1980 actual percentage	6.4	
1997 actual percentage	7.4	
1997 Adjusted for:		Impact on LBW
Maternal Age	7.6	**none**
Number of Births	7.0	**moderate**
Marital Status	7.0	**moderate**

Black Mothers	Percent	
1980 actual percentage	13.5	
1997 actual percentage	13.8	
1997 Adjusted for:		Impact on LBW
Maternal Age	13.6	**moderate**
Number of Births	13.5	**moderate**
Marital Status	13.2	**substantial**

Black mothers

The increase in the percentage of low birthweight for black mothers was much lower than for white mothers. The increase in low birthweight for black mothers can be explained by increases in maternal age, multiple births, and births to unmarried women. If there had been no increases in these risk factors, it is likely that the low birthweight percent for black mothers would have declined

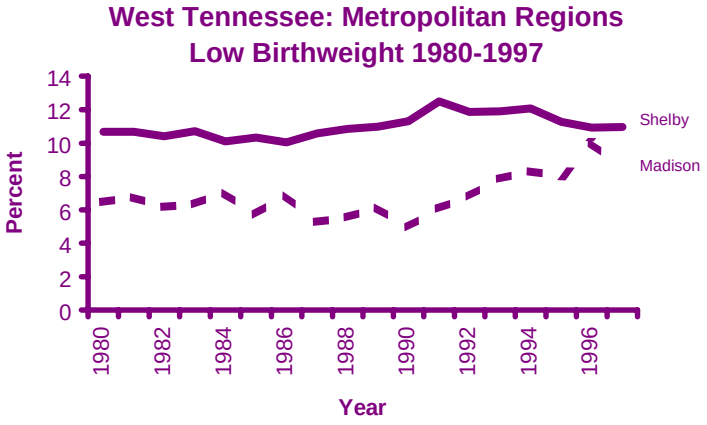
Other Risk Factors

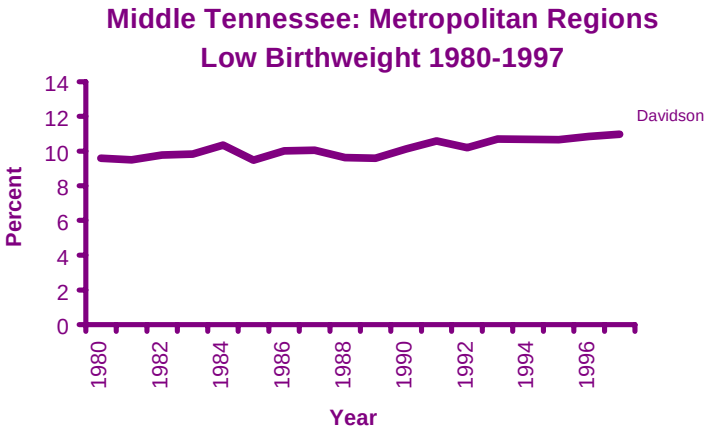
It is important to note that there are other important risk factors that contribute to low birthweight. Cocaine use during pregnancy has been associated with preterm birth. Also, recent findings strongly suggest that maternal infections, such as bacterial vaginosis, result in preterm births. Babies born early for these and other reasons are at a high risk for being low birthweight. At this time, adequate measurement techniques don't exist to allow us to determine the trends in risk factors such as cocaine use and infections. Changes in risk factors such as these may contribute to the unexplained increase in low birthweight, especially among singleton births.

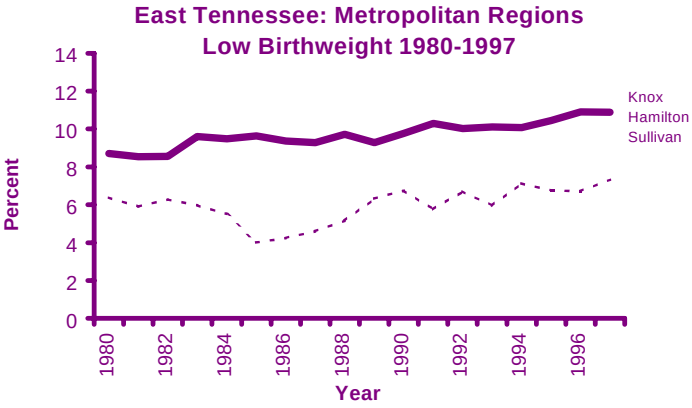
REGIONAL TRENDS

Regional information is provided below for metropolitan and rural regions in both west and east Tennessee. The graphs illustrate the trends in low birthweight from 1980-1997. Information in the accompanying tables describes the average level of low birthweight for each region in the three-year periods for 1980-1982 and 1995-1997. Information about the percent change from 1980 to 1997 is also provided.

metropolitan regions…





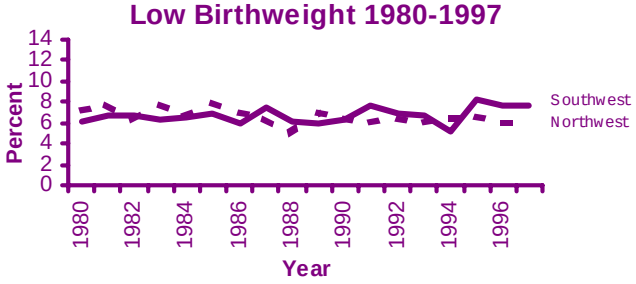


Region	1980-1982 average	1995-1997 average	1980-1997 Percent Change
Davidson	9.6	10.8	13%
Hamilton	7.9	9.9	25%
Knox	8.6	10.8	26%
Madison	6.5	8.9	37%
Shelby	10.6	11.1	5%
Sullivan	6.2	6.9	11%

- Davidson, Knox, Hamilton and Shelby regions all had percentages of low birthweight higher than the TN average for 1997.
- All metropolitan regions had increases in low birthweight from 1980 to 1997. The Madison region had the highest increase in low birthweight.

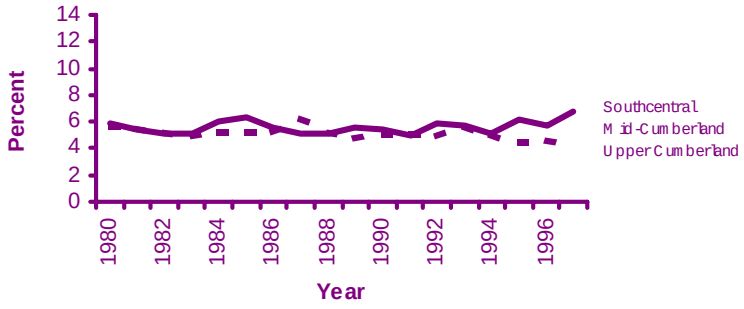
rural regions…

West Tennessee: Rural Regions
Low Birthweight 1980-1997

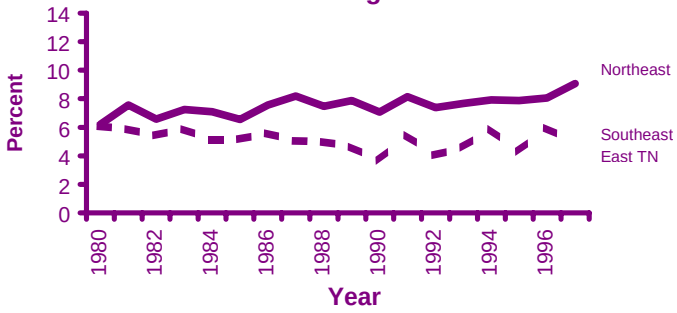


Region	1980-1982 average	1995-1997 average	1980-1997 Percent Change
East Tennessee	5.5	4.0	-27%
Mid-Cumberland	6.0	5.5	-8%
Northeast	6.8	8.3	22%
Northwest	7.2	6.3	-13%
South Central	5.5	6.2	13%
Southeast	5.8	5.1	-12%
Southwest	6.6	7.9	20%
Upper Cumberland	5.6	4.5	-20%

Middle Tennessee: Rural Regions
Low Birthweight 1980-1997



East Tennessee: Rural Regions
Low Birthweight 1980-1997



- All rural regions, except Northeast, had percentages of low birthweight below the Tennessee average.
- There were decreases in low birthweight between 1980 and 1997 for the following rural regions: East Tennessee, Mid-Cumberland, Northwest, Southeast, and Upper Cumberland.
- There were increases in low birthweight between 1980 and 1997 for the following rural regions: Northeast, South Central, and Southwest.

COUNTY TRENDS

The county data presented represent the county in which the birth occurred. Several counties do not have birthing facilities and therefore have very few births.

The tables below provide county-level information on the average number of births per year, the average percentage of low birthweight for 1980-1985, 1986-1991, and 1992-1997, and the general trend from 1980 to 1997. The trends are described as steady, increasing, decreasing, or nonlinear. A nonlinear trend suggests the low birthweight rates were not systematically related to the passage of time.

Note: Average percentages and trends for counties with less than an average of 100 births per year are not included due to the instability of rates computed for low occurrence events

Metropolitan Regions	Average Number of Births	1980-1985 Average	1986-1991 Average	1992-1997 Average	Trend
Davidson	11821	9.8	10.0	10.7	increasing
Hamilton	4841	7.7	8.5	9.4	increasing
Knox	7164	9.1	9.6	10.4	increasing
Madison	2817	6.6	5.6	8.3	increasing
Shelby	15586	10.5	11.0	11.5	increasing
Sullivan	1909	5.7	5.5	6.8	increasing

East Tennessee Region	Average Number of Births	1980-1985 Average	1986-1991 Average	1992-1997 Average	Trend
Anderson	982	5.1	3.9	3.8	decreasing
Blount	758	3.8	3.5	3.4	decreasing
Campbell	207	5.0	4.8	3.8	decreasing
Clairborne	25	--	--	--	--
Cocke	273	5.8	3.7	4.9	decreasing
Grainger	1	--	--	--	--
Hamblen	976	5.7	5.4	5.7	nonlinear
Jefferson	77	--	--	--	--
Loudon	162	3.5	4.1	4.2	increasing
Monroe	228	3.9	2.0	4.0	nonlinear
Morgan	2	--	--	--	--
Roane	304	5.9	4.4	4.2	decreasing
Scott	68	--	--	--	--
Sevier	364	4.2	5.3	4.9	increasing
Union	2	--	--	--	--

Mid-Cumberland Region	Average Number of Births	1980-1985 Average	1986-1991 Average	1992-1997 Average	Trend
Cheatham	3	--	--	--	--
Dickson	405	5.5	5.8	6.9	increasing
Houston	52	--	--	--	--
Humphreys	40	--	--	--	--
Montgomery	1762	5.6	5.1	5.1	decreasing
Robertson	374	8.2	7.3	5.9	decreasing
Rutherford	1530	6.1	6.2	5.6	decreasing
Stewart	2	--	--	--	--
Sumner	1095	4.8	4.5	4.9	nonlinear
Trousdale	2	--	--	--	--
Willamson	450	4.6	4.8	3.6	decreasing
Wilson	653	6.3	5.5	5.8	decreasing

Northeast Region	Average Number of Births	1980-1985 Average	1986-1991 Average	1992-1997 Average	Trend
Carter	395	5.3	5.7	6.5	increasing
Greene	724	6.5	7.2	6.9	nonlinear
Hancock	22	--	--	--	--
Hawkins	86	--	--	--	--
Johnson	33	--	--	--	--
Unicoi	2	--	--	--	--
Washington	1692	7.9	8.7	8.9	increasing

Northwest Region	Average Number of Births	1980-1985 Average	1986-1991 Average	1992-1997 Average	Trend
Benton	1	--	--	--	--
Carroll	326	5.4	5.9	4.8	decreasing
Crockett	1	--	--	--	--
Dyer	747	7.9	7.4	6.5	decreasing
Gibson	284	9.8	7.8	6.8	decreasing
Henry	257	5.8	6.0	8.0	increasing
Lake	1	--	--	--	--
Obion	482	7.2	4.9	6.1	decreasing
Weakley	230	6.5	4.8	6.5	nonlinear

South Central Region	Average Number of Births	1980-1985 Average	1986-1991 Average	1992-1997 Average	Trend
Bedford	231	8.3	6.5	6.7	decreasing
Coffee	634	4.6	4.9	5.5	increasing
Giles	169	6.2	6.7	7.2	increasing
Hickman	4	--	--	--	--
Lawrence	414	3.9	4.1	3.9	steady
Lewis	65	--	--	--	--
Lincoln	187	5.1	5.2	6.1	increasing
Marshall	68	--	--	--	--
Maury	1285	6.4	5.5	6.2	nonlinear
Moore	2	--	--	--	--
Perry	26	--	--	--	--
Wayne	34	--	--	--	--

Southeast Region	Average Number of Births	1980-1985 Average	1986-1991 Average	1992-1997 Average	Trend
Bledsoe	15	--	--	--	--
Bradley	1026	5.7	4.2	4.8	decreasing
Franklin	500	5.5	5.0	5.1	decreasing
Grundy	60	--	--	--	--
Marion	43	--	--	--	--
McMinn	422	4.5	6.5	5.0	nonlinear
Meigs	3	--	--	--	--
Polk	17	--	--	--	--
Rhea	101*	--	--	--	--
Sequatchie	0	--	--	--	--

*Births in Rhea County fell precipitously in 1990 and averaged only 3.3 births/year in the 1992-1997 period. Accordingly, these data were not analyzed.

Southwest Region	Average Number of Births	1980-1985 Average	1986-1991 Average	1992-1997 Average	Trend
Chester	2	--	--	--	--
Decatur	22	--	--	--	--
Fayette	144	8.1	5.7	7.0	decreasing
Hardeman	52	--	--	--	--
Hardin	78	--	--	--	--
Haywood	237	7.5	6.5	6.7	decreasing
Henderson	84	--	--	--	--
McNairy	259	4.9	5.4	5.8	increasing
Lauderdale	2	--	--	--	--
Tipton	220	5.5	8.5	7.6	increasing

Upper Cumberland Region	Average Number of Births	1980-1985 Average	1986-1991 Average	1992-1997 Average	Trend
Cannon	41	--	--	--	--
Clay	6	--	--	--	--
Cumberland	584	5.6	5.5	5.8	steady
Dekalb	131	4.6	4.0	7.7	increasing
Fentress	100	5.8	5.2	3.9	decreasing
Jackson	24	--	--	--	--
Macon	11	--	--	--	--
Overton	233	5.2	4.5	4.4	decreasing
Pickett		--	--	--	--
Putnam	958	5.2	4.6	3.8	decreasing
Smith	141	6.0	6.4	4.5	decreasing
Van Buren	0	--	--	--	--
Warren	369	6.0	6.6	5.7	nonlinear
White	106	2.8	8.2	6.4	increasing

SUMMARY

The percentage of low birthweight in Tennessee has been rising since the 1980s, although it has remained steady for the past several years. The increasing trend seen in Tennessee is similar to the national trend in low birthweight, which is also increasing. However, the percentage of low birthweight in Tennessee is higher than the national percentage.

Percentages of low birthweight differed among groups of women. The percentage of low birthweight for black women is about twice the percentage for white women. However, the trend for white women increased steadily, whereas the trend for black women remained steady. Low birthweight percentages were highest for the youngest and oldest mothers. Finally, low birthweight percentages are higher for twin and triplet plus births than for singleton births.

In addition to the increase in low birthweight, there have also been changes in some of the risk factors associated with low birthweight. There were quite a few improvements: fewer births were to teenage women, more women received adequate prenatal care, fewer women smoked during pregnancy and the average level of maternal education increased. However, there were areas of concerns in other risk factors: more births were to older women, there was an increase in the percentage of mothers who were unmarried, and there was an increase in the percentage of multiple births.

Why is low birthweight increasing? In Tennessee, the increase for white mothers can be partially attributed to increases in multiple births and an increase in the percentage of unmarried mothers. However, a large portion of the increase remains unexplained and may be due to risk factors that are not currently measured. For black women, the increase in low birthweight can be explained by changes in maternal age, increases in multiple births, and increases in the percentage of births to unmarried women. If there had been no changes in these risk factors, it is likely that percentages would have declined for black women.

Future research should attempt to identify and measure other risk factors for low birthweight. By identifying which risk factors are associated with the increase seen in low birthweight, health providers and policy makers will be better able to develop programs to address these factors.